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BACILLARY WHITE DIARRHEA

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BACILLARY WHITE DIARRHEA

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Within the last few years the disease Bacillary White Diarrhea of chickens has become very prevalent in different sections of the state of Kentucky. At present in many counties it is confined to a few flocks, but if the disease continues to spread as rapidly as it has during the last two years, in a short time it will cover the entire state.

The rapid spreading of this disease may be attributed to the following causes:

1. The intensive production and pure breeding of chickens. To accomplish either of the above the breeder generally is compelled to obtain eggs or breeding stock from other flocks.
2. The hatching of eggs in incubators used for eggs from other flocks without carefully disinfecting after the previous hatch; also the selling of setting eggs and baby chicks from infected flocks.
3. The close association of flocks on adjacent farms. Dissemination of the disease by such means is discussed under source of infection.

DEFINITION

Bacillary White Diarrhea is a specific infectious disease of adult and baby chicks, usually assuming a chronic form in the adult and an acute septicemic form in the baby chick, which causes severe losses the first three weeks following hatching. The term White Diarrhea is also commonly applied to numerous disease conditions of chicks which closely resemble Bacillary White Diarrhea, both clinically and pathologically. They may be produced by overheating or chilling, in either incubator or brooder, and by improper feeding. The mortality from these causes frequently runs as high as for the infectious type. The latter can be differentiated only by bacteriological examination.

ETIOLOGY

Salmonella pullora, the cause of the disease, is a long, slender, rod shaped organism, .3-.5x1.0-2.5 microns, which closely resembles in appearance the organism of typhoid fever. It stains readily with the ordinary aniline dyes, has rounded ends, does not produce spores and is Gram-negative. The organism can readily be isolated from diseased birds, in that it is usually present in a pure state in the ova of adult fowls and in the blood and liver of baby chicks. It grows on practically any of the common laboratory media.

SOURCE OF INFECTION

The disease may enter a flock by numerous ways, all of which must be taken into consideration when attempting to prevent the disease. It is capable of being transmitted, like any other infectious disease, by contaminated foodstuff, water, soil, etc. However, its principal means is by the addition of infected chicks or adult fowls to the flock. Infected adult hens are usually spoken of as *carriers;* they harbor the causative organism in their ovaries and thru the ova the eggs are infected; chicks in turn are infected thru the egg. The organisms in the eggs multiply quite rapidly during incubation and are taken into the chick's body by the assimilation of the yolk and egg albumen. Chicks thus infected may die in the shell or shortly after hatching or, in a few cases, completely recover after a duration of illness. Diseased chicks in a brood can infect other chicks by means of their droppings or by direct contact. About 25 per cent of the chicks that recover harbor the disease until they are mature, and then are not only capable of transmitting the disease to baby chicks, but can infect mature birds thru their droppings.

While every commercial hatchery tries to obtain the desired eggs from noninfected flocks, they are not always successful, and in many instances their chicks have been responsible for the introduction of the disease into a clean flock. Many hatcheries are now testing the flocks from which they receive eggs and with conscientious service they should soon be able to hatch disease-free chicks.

SYMPTOMS

The symptoms manifested by adult fowls are so variable and similar to other diseases that it is seldom possible to make a clinical diagnosis of Bacillary White Diarrhea. They may show indication of illness for weeks, during which time the most notable symptoms are: Unthriftiness, ruffled feathers, pale skin and visible mucous membranes, poor appetite, weakness of legs and occasionally a diarrhea that mats the feathers below the vent.

The symptoms in baby chicks depend to a large extent upon the duration of the disease. Sick or dead chicks may be found the first day hatched; however, the number will be greatly increased following the second and third days. At that time the following symptoms may be observed: The chicks appear diseased, sleepy, do not eat and remain close to the heater or huddle around the others. The feathers become ruffled, the wings dropped and the head tucked under. The chick keeps peeping continually and moves around very little. The abdomen by this time is greatly enlarged and protrudes back between the legs, giving the chick a *short-backed* characteristic appearance. "Pasting up behind" may not occur on those that die early in the disease. The later cases, however, soon become matted around the vent with a shiny white accumulation of feces, which may vary in consistency from watery to sticky and syrup-like. During the later stages of the disease the chick becomes very weak, unable to stand and finally passes into a state of unconsciousness.

The disease usually runs its course during the first three or four weeks of life, after which the chicks gradually recover except for an occasional death. Those that recover remain unthrifty and weak for a considerable time, are slow to develop and seldom equal the growth of normal chickens. The mortality runs very high with baby chicks, and often causes a loss of from 50 to 75 per cent. In adult fowls the loss is not so great, usually occurring gradually thruout the year; however, the disease occasionally assumes an acute form and mortality runs high.

LESIONS

The lesions in hens are very pronounced and can easily be detected by any one. The ovaries are practically the only organs which consistently show pathological changes. They differ from normal in both shape and color. The average poultry raiser is familiar with the appearance of the ovaries of a normal hen, especially one that is laying or about to lay. They consist of a cluster of soft, round, yolk-like bodies that vary in size from a buckshot to a fully developed egg yolk; the smaller ones are almost white, but the color changes to a bright reddish yellow as they become larger. The infected ova differ in that, instead of being round, they are usually irregular or triangular in shape; the consistency is often firm or even hard, while the color is changed to a yellow brown when hard, or a darkish brown when soft. All the ova on the ovary may not be involved and in those instances one may observe apparently normal and also pathological bodies in the same hen. A condition frequently found in hens that have died with the disease is a general peritonitis which has resulted from the rupture of one or more ova into the abdominal cavity. Cases of egg bound are frequently due to Bacillary White Diarrhea.

Postmortem lesions are not as pronounced in the chick as in the adult hen, and a diagnosis must usually be verified by bacteriological examinations. The most prominent lesions are: Emaciation of the chick, pale yellowish liver with more or less browish patches or streaks, and unabsorbed yolk-sac. The latter may be found in chicks three weeks or more of age, and varies in color and consistency about the same as the ova found in hens. Different parts of the digestive tract, especially the ceca, may be slightly distended with slimy, gray or brownish feces.

PREVENTION

That Bacillary White Diarrhea can be controlled and prevented has been proved by a number of investigators; however, the method used by them is not available to all poultry raisers at the present time. It necessitates that each individual mature

bird in every infected flock be given a blood agglutination test, similar to that employed for abortion in cattle and typhoid fever in the human. The fowls which react to this test are then discarded as breeding stock. The disease-free hens are retained for stock and again tested the following year with what new hens have been selected. The two consecutive tests usually eliminate the diseased birds. Pullets do not always react, so the test should be deferred until they are mature or laying.

The test as performed by most laboratories is as follows:

The fowls to be tested are bled from the wing vein just above the second joint, into a sterile container, either by a needle or by incising the vein with a sharp knife. Two to three cubic centimeters of blood should be collected from each bird. The blood tubes are then slanted and the blood allowed to clot, after which they are placed in a refrigerator until shipped or taken to the laboratory.

A bacterial suspension of Salmonella pullora is prepared by washing off 24 to 48 hour old cultures of the organism with a sterilized physiological salt solution which contains .5% carbolic acid. This suspension is then diluted to the extent that when it is placed in an ordinary test tube, print held behind it is legible thru it. Since experience is necessary to obtain the proper dilution, a tube of same, when once acquired, should be preserved for future comparison.

The test proper is the placing in a small glass tube 3 c.c. of the above bacterial suspension to which is later added .06 c.c. of blood serum from chicken. Tube is then thoroly shaken and 1 c.c. is withdrawn and added to another tube that contains 1 c.c. of bacterial suspension, and shaken. The two tubes containing respectively dilutions of serum—1:50 and 1:100—are then placed in an incubator at 37°C temperature and examined 12 to 24 hours later. Negative tubes remain unchanged, while positive ones show a white deposit at bottom of the tubes with the liquid above perfectly clear. If neither tube is completely agglutinated the chicken may be considered negative, suspicious or positive, depending on extent of agglutination. Correct interpretation of the results requires considerable experience and knowledge on the part of the technician.

SANITATION

Sanitary measures must not be ignored. The incubators and brooders should be cleaned and disinfected before and after each hatching, with a strong disinfectant, such as 5 per cent carbolic acid or 5 per cent creosote or creolin. At the time of

hatching, the incubator should be darkened by covering its windows. This prevents the chicks from pecking at feces and thus becoming infected during the most susceptible period of their life. The floor of the brooder should be covered with sand, which is removed at frequent intervals, the floor being disinfected before new sand is applied. Chicken houses, pens, etc., should also be cleaned and disinfected frequently. If the flock is badly infected it is advisable to change the runs to new grounds, if possible.

TREATMENT

No treatment has been found successful for mature birds. The losses in baby chicks, however, can be greatly lessened by the administration of intestinal antiseptics, together with sanitation and hygiene. Bichloride of mercury, 15 grains to a gallon of sour milk, has given the best results. Sour milk alone lessens the losses from Bacillary White Diarrhea, besides being a valuable food, and when obtainable should be given with bichloride of mercury to chicks in place of water, at least until they are a week old. If sour milk is not available the bichloride of mercury is used in water. A combination of bichloride of mercury 7 grains, calcium sulphocarbonate 15 grains and sodium sulphocarbonate 15 grains, has given good results. Such drugs as potassium permanganate and copper sulfate, frequently recommended, are not as satisfactory as the above mentioned.

In one flock where the disease had taken 70 per cent of the baby chicks, the subsequent hatches were given bichloride of mercury, calcium and sodium sulphocarbonates in water immediately after hatching, with the result that 94 per cent of the chicks were raised. A small pen of chicks taken from the same hatch and not given the medicated water, developed the disease with a subsequent loss of over 50 per cent. While the chicks that received the medicated water were raised and developed normally, it must be remembered that many of them would later be carriers and the disease would not be eliminated by this treatment.